QC1- Inspect dimensions to dimension sheet

Quality Control

Work Order ID 87846

110

Memo

0.00

0.00

1 \$ Ke 12-7-18

										DQA:	Date:	
NCR: Y	es / 1	lo			WORK ORDER NON-	CON	NFORM	MANCE / UPD	ATE			
					<u>,</u>					QA Closed:	Date:	
Work Orde	ar.				DISPOSITION				AGAINST DE	PARTMENT,	/PROCESS	
Part N	No				Rework Scrap Use-as-is Work Order Update		f Therm	Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update		nitial	Acti	on	Sign &		
Cause	Da	te Step	Qty		or Non-conformance	Ch	ief Eng	Descri	ption	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training								-				
Unapproved								_				
						AUL	T CATE	GORY		···		
Landi	ng Gear				General				<u> </u>	7	_	7
	Crack	e Not Conce s led/Crimped		o/s	Bend BOM/Route Broken/Damaged Burrs Contamination		i i	ion Incomplete ions Incomplete/U	Inclear	Ovalized Over/Under Part Incorre Part Lost/M Part Moved	ct	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled
1	Heat	Treat			Countersink		Mislabe	eled		Positioned \	<b>V</b> rong	

Misread

Out of Calibration

Out of Sequence

Outside Dimensions

Offset

Power Loss/Surge

Other

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Inspection Strip in Tube

Torque Waves in Extrusion

Cut Too Short

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Page 2

July-16-12 2:25:09 PM

Item ID: D212-664-101TRN Accept \*N900040100\* Revision ID: Item Name: Crosstube Turning Detail **Start Date:** 16/07/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 30/07/2012 Req'd Qty: 1.00 **Customer:** Reference: Approvals: **Process Plan:** Date: **Tooling:** Date: Date: SPC (Y/N): Date: Operation Sequence ID/ Set Up/ Tool ID Tool # Plan Work Center ID Description Run Hours 120 0.00 MORI SEIKI CNC LATHE LARGE \*120\* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Turn second side as per Folio FA113 2-Blend transition lines only, \*\*do not sand whole tube\*\*: \*Use mill bastard file, brush file repeatedly with file card. \*Do not use sandpaper coarser than 320 grit. FOLIO REV: DWG REV: 3-Remove sand and plugs

1 \$ Kc-12-7-18

130

0.00

\*120\*

+ PERFORM ULTRA SONIC MEASUREMENT

Setup Start

Run

Accept

Qty

Code

Reject

Stop

Reject

Otv

Number Stamp

Insp.

QC1- Inspect dimensions to dimension sheet

QC

Memo

0.00

Quality Control

NCR:	Yes	/ No				WORK ORDI	ER NON-C	ONFOR	MANCE / UP	DATE				
						T	<u> </u>					QA Closed:	Date	2.
Work Ord	ler:					DISPOS	ITION		_	AGA	INST DE	PARTMENT	/PROCESS	
Part NCR						l Work Ordei	Rework Scrap Use-as-is Update		Skid-tube Machining moforming Large Fab	Crossi Small Finis Compo	Fab hing	4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work ord	er update	Initial	Ad	tion		Sign &		
Cause		Date	Step	Qty	(	or Non-conformar	ice	Chief Eng	Desc	cription	1	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved		,	**			· .	F	AULT CATE	GORY					
Land	ing (	Gear	****			General								
		Bending Centre N Cracks Crushed/ Cuffs Heat Trea Inspectio Ripples in	Crimped at n Strip in a Bend	Tube		Bend BOM/Route Broken/Damage Burrs Contamination Countersink Cut Too Short Drill Holes	d	Instruc Mainto Mislabo Misrea Offset	tion Incomplete tions Incomplete, enance eled d	/Unclear		Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned \ Power Loss/	ct issing Wrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
1	1	Torque V	/aves in E	extrusion		Drawing		Out of	Calibration					

Out of Sequence

Outside Dimensions

Date:

DQA:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

\*87846\*

Page 3

July-16-12 2:25:09 PM

Item ID: D212-664-101TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 16/07/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 30/07/2012 Req'd Oty: 1.00 **Customer:** Reference: Run Process Plan: \_\_\_\_\_ Date: Approvals: Tooling: Date: Stop \_\_\_\_\_ Date: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Accept Reject Insp. Reject **Work Center ID** Description **Run Hours** Code Number Stamp Qty 140 QC8- Inspect parts - second check 0.00 \*140\* 0.00 Memo Quality Control + CHECK ULTRA SONIC MEASUREMENT AND ORIENTATION FOR BENDING 145 0.00 \*1/5\* Crosstubes 0.00 Memo Crosstubes GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY. 150 0.00 \*150\* HandFXtube 0.00 Memo Hand Finishing Crosstubes 1- PRESSURE WASH X-TUBE INSIDE AND OUT

2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE

NCR:	⁄es	/ No				<b>WORK ORDER NON-</b>	CO	NFOR	MANCE / UPI	DATE				
· · · · · · · · · · · · · · · · · · ·			*************						<u></u>		QA Closed:	Dat	te:	_
Work Orde	er: .					<b>DISPOSITION</b> Rework	7		clid Auto-		EPARTMENT,	/PROCESS  Water Jet		
Part N	•					Scrap Use-as-is Work Order Update		Thern	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	⊣	d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root					Descri	ption of work order update	T	Initial	Act	tion	Sign &	<u> </u>		_
Cause		Date	Step	Qty		or Non-conformance	CI	nief Eng	Desci	ription	Date	Verification	n QC Inspector	
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved					ī	¥3.								
				111			FAU	LT CATE	GORY			<u>.</u>	-	_
Landi		Bending Centre No Cracks Crushed/G Cuffs Heat Trea Inspection Ripples in	Crimped. t n Strip in Bend	Tube		General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes		Instruct Mainte Mislabe Misread Offset	ion Incomplete ions Incomplete/l enance eled	Unclear	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned V Power Loss/	ct issing Vrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other	
	I	Torque W	aves in F	xtrusio	n I	Drawing	1	Dut of (	alibration					

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Page 4

July-16-12 2:25:09 PM

Item ID: D212-664-101TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail Start Qty: 1.00 **Start Date:** 16/07/2012 **Cust Item ID:** Required Date: 30/07/2012 **Reg'd Qty:** 1.00 **Customer:** Reference: Run Process Plan: Date: Approvals: **Tooling:** Date: Stop QC: \_\_\_\_ Date:\_\_\_ SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Reject Tool ID Tool # Plan Reject Accept Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp 160 QC5- Inspect part completeness to step on W/O 0.00 \*160\* 0.00 Memo Quality Control 170 0.00 Packaging \*170\* Packaging 0.00 Memo Packaging Identify and Stock in kanban rack Location: LG 180 QC21- Final Inspection - Work Order Release 0.00 12/7/2348) MF 1207-23 \*120\* 0.00 Memo Quality Control

NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORI	MANCE / UP	DATE			
					···						QA Closed:	Date	•
Work Ord	er:					DISPOSITION				AGAINST DE	PARTMENT	PROCESS	_
Part I						Rework Scrap Use-as-is Work Order Update			Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite	4	Water Jet d. Eng. Coor. e/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update	] 1	Initial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling									()				
Operator													
Material			1										
Setup													
Other													
Process		÷											
Supplier										-4			
Training	L		i e										
Unapproved							丄						
!						F	AUI	LT CATE	GORY				
Landi	ng (	1				General		1			=	_	
	<u> </u>	Bending				Bend	_	Grain			Ovalized		Pressure/Forced
	<u> </u>	Centre No	ot Concei	ntric to (	D/S	BOM/Route	<u> </u>	Hardwa			Over/Under	<u>-</u>	Temperature/Cure
	匚	Cracks				Broken/Damaged	L	- '	ion Incomplete		Part Incorre	_	Weld
	<u></u>	Crushed/	Crimped,		_	Burrs	$\perp$	-	tions Incomplete/	'Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
	$ldsymbol{ldsymbol{ldsymbol{eta}}}$	Cuffs			,	Contamination		Mainte			Part Moved		
	_	Heat Trea			_	Countersink	$\perp$	Mislabe			Positioned V		_
	$ldsymbol{ldsymbol{ldsymbol{eta}}}$	Inspection		Tube		Cut Too Short	$\perp$	Misread	d		Power Loss/	Surge	Other
	$oxed{oxed}$	Ripples in				Drill Holes		Offset			10		
1		Torque W	aves in E	xtrusion	1	Drawing		Out of	Calibration				

Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish

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### **Picklist Print**

July-16-12 2:25:12 PM

Work Order ID: 87846

D212-664-101TRN

Parent Item Name: Crosstube Turning Detail

\*87846\*

\*D212-664-101TRN\*

**Start Date:** 16/07/2012

**Required Date:** 30/07/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

Parent Item:

IPP Rev:A 08-03-06 new issue DD verified by:ec

IPP Rev B 08.04.02 removed Polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status	
D6005-128		Manufactured	No		_ ,,	120	Each	14.0000	1	1				
*DC00E 40	)O*								مله مله					

ひんししち-1281

Crosstube Material

**Location** Loc Qty Loc Code LG 14 14

\_ [ mm.l. 12/07/16

		Ē		DQA:	Date:	
ICR:	Yes / No	•	WORK ORDER NON-CONFORMANCE / UPDATE			

	17.4									QA Closed:	.Date:	
Work Order	r:	*			DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part No	o. <u>***</u>	,			Rework Scrap	-	1	Skid-tube Machining	Crosstube Small Fab	Pro	Water Jet d. Eng. Coor.	Engineering Quality
	3.00	in the			Use-as-is	1		noforming	Finishing		re/Packaging	Other
NCR No	o	*			Work Order Update	1	,,,,	Large Fab	Composite	,	Supplier	
								·				<b>-</b>
Root		;		Descr	iption of work order update	Ī	nitial	Act	ion	∵Sign &	- "	
Cause	Date	Step	Qty	4.7	or Non-conformance	Ch	ief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data							÷.					
Equip/Tooling			1		4		,					
Operator		*	1			•						
Material							÷					
Setup			1					A.		,		
Other												
Process												
Supplier	v (a)		1	>><								79
Training						_		i				
Unapproved	•		<u> </u>									
						FAUL	T CATE	GORY				
Landin	g Gear			_	General							
	Bending				Bend		Grain		<	Ovalized		Pressure/Forced
	Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	ire		Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged		Inspect	ion Incomplete		Part Incorre	ct	Weld
	Crushed/	Crimped			Burrs		Instruct	tions Incomplete/l	Jnclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs				Contamination		Mainte	enance		Part Moved		
	Heat Trea	at			Countersink		Mislabe	eled		Positioned V	Vrong	
[	Inspection	n Strip in	Tube		Cut Too Short		Misrea	d		Power Loss/	'Surge	Other
	Ripples in	Bend			Drill Holes		Offset			- '		
	Torque W	aves in E	Extrusio	n T	Drawing		Out of	Calibration				·
	Turning S	equence			Finish		Out of	Sequence				,
100	s. Wave/Tw	ist in Tul	he		Teolio		Outside	Dimensions	14			

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	87841
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: D		Page 1 of 2

## FIRST ARTICLE INSPECTION CHECKLIST

	spection Sheet awing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	*Comments
	0.200	+/-0.010	200				
	R0.063	+/-0.010		-		VERN	CNC-08
	2.740	<del></del>	.063	•		.KG	
		+0.005/-0.000	2.730			VERN	CNC . 08
	5.097	+/-0.030	5.097				
	2.304	+0.005/-0.000	2.309				1
<	2.340	+0.005/-0.000	2,342				
E I	2.398	+0.005/-0.000	2:402		А.		
SIDE	2.448	+0.005/-0.000	2.453				
	2.498	+0.005/-0.000	2.507			1	
	2.549	+0.005/-0.000	2.554	//			
	2.599	+0.005/-0.000	2.604				
	2.671	+0.005/-0.000	2.673				
	2.701	+0.005/-0.000	2.704				
	,		32			<b>V</b>	<b>b</b>
	0.200	+/-0.010	:200			shalos	CAIC 03
	R0.063	<sup>\$*</sup> +/-0.010	-063	1/		26	
	2.740	+0.005/-0.000	2.743			LERN	CNC 08
	5.097	+/-0.030	5.097				002-08
	2.304	+0.005/-0.000	2.309				
	2.340	+0.005/-0.000	2 343			1	
E B	2.398	+0.005/-0.000	2.403				
SIDE	2.448	+0.005/-0.000	2.453			<del> </del>	
",	2.498	+0.005/-0.000	2.503			1	
	2.549	+0.005/-0.000	2.554				
	2.599	+0.005/-0.000	2.603				
	2.671	+0.005/-0.000	2.673				
	. 2.701	+0.005/-0.000	2.702	-/-		*	
	126.514	+/-0.020	126-514			type	16-22

											DQA:	Date:	
NCR:	Yes /	No				WORK ORDER NON-C	10:	NFORM	MANCE / UPI	DATE			
										· · · · · · · · · · · · · · · · · · ·	QA Closed:	Date:	
Work Ord	er:					DISPOSITION			,	AGAINST DE	PARTMENT	/PROCESS	
Part I	_					Rework Scrap Use-as-is Work Order Update		f Therm	Skid-tube  Machining noforming Large Fab	Crosstube Small Fab Finishing Composite	1	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update	Į	nitial	Act	ion	Sign &		
Cause		Date	Step	Qty		or Non-conformance	Ch	ief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator													
Material	П												į.
Setup	П												}
Other	П												
Process	П												
Supplier													
Training													
Unapproved													
						F <i>i</i>	AUL	T CATE	GORY				
Landi	ng Gea	ır				General				_	,	<b></b>	<b>-</b>
	B∈	ending				Bend		Grain			Ovalized		Pressure/Forced
	Ce	ntre No	t Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	∐ Cr	acks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	Cr	ushed/0	Crimped.			Burrs		Instruct	ions Incomplete/l	Unclear	Part Lost/M	issing	Wrong Stock Pulled
	∐Cı	ıffs				Contamination		Mainte	nance		Part Moved		
	∐н∈	eat Trea	t			Countersink		Mislabe	led		Positioned V	Wrong	
	$\Box_{in}$	cnaction	Strin in	Tubo		Cut Too Short	Г	Microse	I		Power Loss	Surgo	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

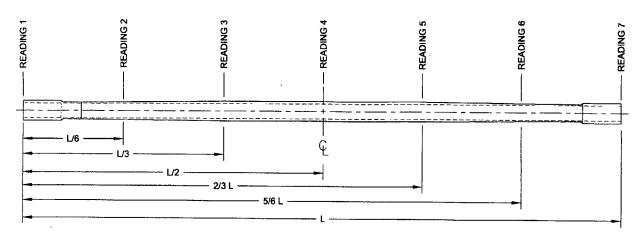
Drawing

Finish

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DART AEROSPACE LTD	Work Order:	87846
Description: Crosstube Assembly (205/212/412 High Fwd)	Part Number:	D212-664-141
Inspection Dwg: D212-664-141 Rev: D		Page 2 of 2

## **WALL THICKNESS MEASUREMENT**



	WALL	THICKNESS	MEASUREME	NT (IN)	Deviation	
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
READING 1 L= 0"	, 378	.37/	.372	.384	.013	
READING 2 L=	. 244	.246	243	.242	.004	
READING 3 L=	.35/	,350	.355	.355	.005	<del>-</del> !
READING 4 L=	380	.370	.385	.390	.020	0.048"
READING 5 L=	. 344	. 352	360	-357	,016	
READING 6 L=	~233	.264	. 245	.220	. 044	
READING 7 L=	. 386	380	- 365.	.371	,021	

## **Calibration Result**

Actual Block Thickness: 100 500

-Sitescan 250 Measured Thickness: 100-500

Preliminary Approval:

Date:

Measured by:	Audited by:
Date: 12-7-/8	Date: 12-7-

Rev	Date	Change	Revised by	Approved
Α	05.04.27	New Issue (P/O D412-664-101)	KJ/JLM	
В	06.03.15	Tolerance revised for 5.097 per Dwg Rev update	KJ/JLM	
С	07.05.28	Dwg Rev updated	KJ/JLM	
D	10.02.02	Dimension 126.514 was 126.51	KJ • A	
E	12.06.04	Wall thickness form added	KJ 👭	111

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON-	OI	NFORN	MANCE / UP	DATE	QA Closed:	Date:	
				-		DISPOSITION				AGAINST DE			
Work Ord	er:						,						
Part I	Vo.					Rework Skid-tube Crosstube  Scrap Machining Small Fab  Use-as-is Thermoforming Finishing			4	Water Jet d. Eng. Coor.	Engineering Quality		
NCR I	No.				<del></del>	Work Order Update Large Fab Composite			Rec/Stor	re/Packaging Supplier	Other		
Root					Descri	ption of work order update	Initial Action		tion	Sign &			
Cause		Date	Step	Qty	C	or Non-conformance	Ch	nief Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data					<u> </u>								
Equip/Tooling													
Operator													
Material													
Setup											, re		
Other								Ì			17:		
Process			İ										
Supplier													
Training													
Unapproved							1						
			•			F	AUL	LT CATE	GORY				
Landi	ng (	Gear				General		_					
		Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre No	ot Concei	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
		Crushed/Crimped.				Burrs		Instructi	ions Incomplete/	Unclear	Part Lost/Mi	ssing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Moved	_	_
		Heat Treat				Countersink		Mislabe	led		Positioned V	Vrong	
	Г	Inspectio	n Strip in	Tube		Cut Too Short		Misread			Power Loss/	Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

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Item	Qty -141	Qty -141B	Part Number	Description
1	х		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

#### **GENERAL NOTES:**

С

R

1) MATERIAL: MANUFACTURED FROM D6005-128

FINISHED LENGTH = 126.514±0.020

CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4 2

3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

UNITS: INCHES UNLESS OTHERWISE NOTED.

BREAK SHARP EDGES: 0 005 TO 0.010 MAX.

IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS

WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664) D212-664-141B = 33.6 lbs (PER IIN-D212-664)

8) PART IS SYMMETRIC ABOUT CENTERLINE.

9) RUN CUTTER OFF PART, BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH

10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.

11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY **RETURN TO** ENGINEFRING TINCONTROLLED COPY SUBJECT TO AMENDMENT

REMOVED FROM UNDER REVIEW PER UNDER REVIEW SCN #11-614

DEO ATTACHED

В

D	REORG TO CUR REMOV & 86-3);	ANIZED VIEWS RENT STANDA ED REF & ADD RELOCATED I TURNING DET	ENERAL NOTES/PART LIST;  ON REFORMATTED DRAWING  RDS; ADD -1418 (ZN B4-2, D4-2);  I TOLERANCES (ZN B4-3, C6-3, C8-3  FLAG #6 PER PAR 08-046 (ZN A5-3);  'AIL & UPDATED TOLERANCE TO	RF	09.09.30				
С			SION STRIP; ADD MAGNOBOND ERSE CLAMPS	PH	07.03.08				
₿.	ADD H		MPATABILITY WITH BHT/AA	PH	05.02.04				
Α	NEW IS	SSUE		PH	00.12.12				
REV.			DESCRIPTION	BY	DATE				
DESIGN		PH	DART AEROSP	ACE	LTD				
DRAWN		RF	HAWKESBURY, ONTARI	O, CANA	ADA .				
CHECKE	D	q)	DRAWING NO.		REV. D				
MFG. AF	PR.	77	D212-664-141	s	HEET 1 OF 4				
APPRO\	/ED	10	TITLE		SCALE				
DE APP	₹.		XTUBE ASS'Y (205/212/412 HI FWD) NTS						
DATE	09.0	9.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS COCUMENT ENGINEER FOR COMPERENTIAL, AND IS SUPPLIED ON THE COPIESS CONCATION THAT IT IS NOT TO BE USED FOR ANY MURROSS OR COMMENTATED TO ANY CHIEFR RESISON WITHOUT						

												DQA:	Date	e:	
NCR:	Yes	/ No				WORK ORDER NON-O	COI	NFORM	MANCE / UP	DATE		·			
F								_			С	(A Closed:	Date	e:	
Work Orde	er.					DISPOSITION				AGAINST D	EP/	ARTMENT/	PROCESS		
	٠ ِ No.					Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube  Machining Small Fab  Thermoforming Finishing  Large Fab Composite			Prod. Eng. Coor. Rec/Store/Packaging				Engineering Quality Other
Root		-			Descri	ption of work order update		Initial	Ac	tion		Sign &			
Cause		Date	Step	Qty	(	or Non-conformance	Ct	nief Eng	Desc	cription		Date	Verification		QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved															
							AUI	LT CATE	GORY						
Landi		ng Gear  Bending Centre Not Concentric to O/S Cracks Crushed/Crimped. Cuffs Heat Treat Inspection Strip in Tube				General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear Maintenance Mislabeled Misread			P	Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V	ssing Vrong		Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
I		Ripples in	Bend			Drill Holes	1	Offset							

Out of Calibration

Out of Sequence
Outside Dimensions

Turning Sequence

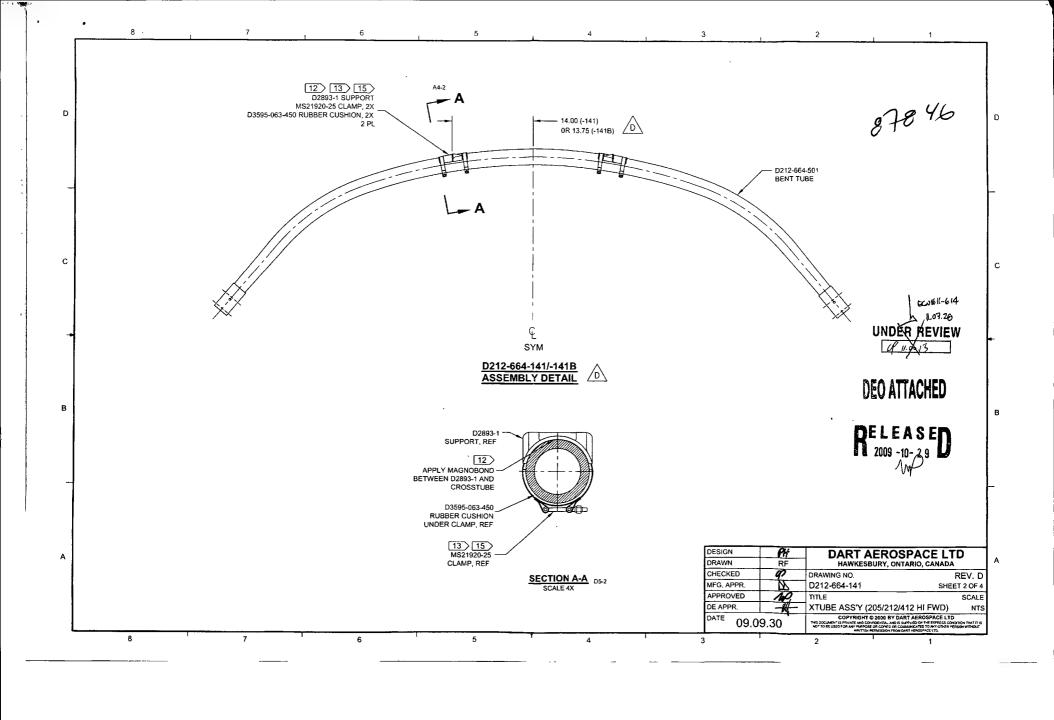
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



											DQA:	Date	:
NCR:	⁄es	/ No				WORK ORDER NON-	100	NFOR	MANCE / UPE	DATE			
											QA Closed:	Date	:
Work Orde	er:					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part I	No.	-				Rework Scrap Use-as-is Work Order Update	Scrap Machining Small Fab Use-as-is Thermoforming Finishing			1	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root					Descri	tion of work order update	Π	Initial Action			Sign &		
Cause		Date	Step	Qty		or Non-conformance		Chief Eng Description			Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator							1						
Material													
Setup											1		
Other													
Process													
Supplier													
Training													
Unapproved													
						F	AUL	T CATE	GORY				
Landi	ng (	Gear				General		•			-		_
		Bending				Bend		Grain			Ovalized		Pressure/Forced
		Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re		Over/Under	tolerance	Temperature/Cure
	L	Cracks			<u> </u>	Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	Crushed/Crimped.					Burrs		Instruct	ions Incomplete/L	Jnclear	Part Lost/M	issing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance	,	Part Moved		
		Heat Treat				Countersink		] Mislabe	led		Positioned \	Wrong	
,		Inspection	n Strip in	Tube		Cut Too Short		Misread	j		Power Loss,	/Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

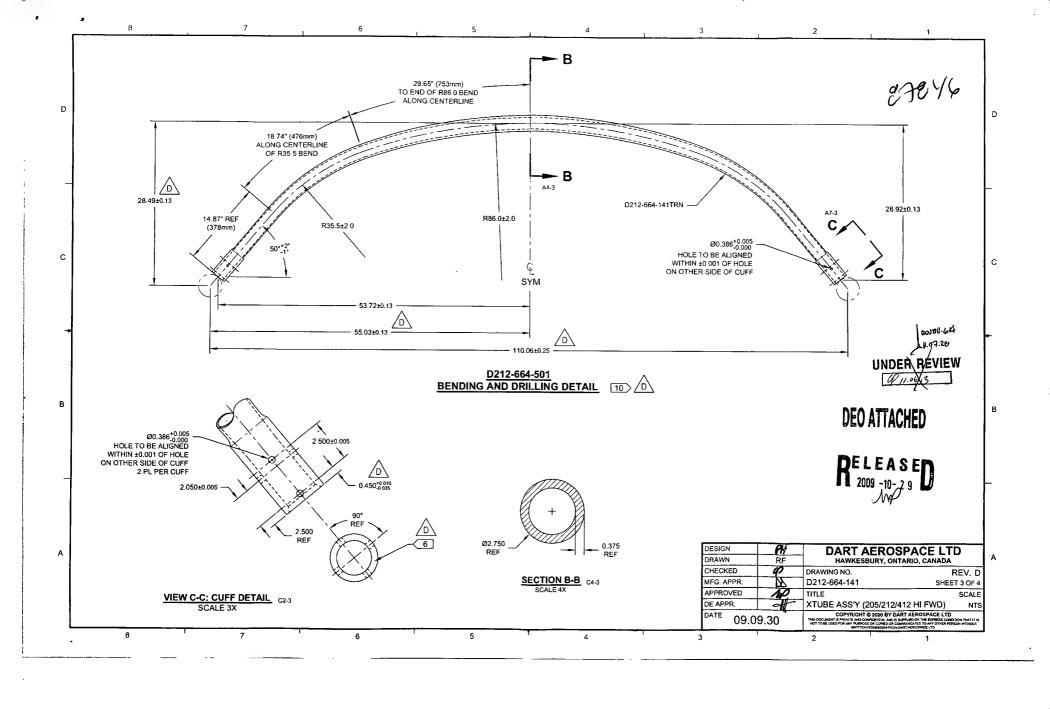
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

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											DQA	Date:	
NCR:	Yes	/ No				WORK ORDER NON-O	COI	NFORM	/ANCE / UP	DATE		· <del></del>	
·											QA Closed	: Date:	
Work Ord	er.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part I	No.				,	Rework Scrap Use-as-is Work Order Update	Scrap Machining Small Fab Use-as-is Thermoforming Finishing			4	Water Jet od. Eng. Coor. ore/Packaging Supplier	Engineering Quality Other	
Root					Descri	ption of work order update	1	Initial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Cr	nief Eng	Desc	ription .	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved								; \	· .				
						F	AUI	LT CATE	GORY				
Landi	ing G	iear				General		-					_
	Bending Centre Not Concentric to O/S Cracks Crushed/Crimped. Cuffs Heat Treat Inspection Strip in Tube				o/s	Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short		Instruct Mainte Mislabe Misreac	on Incomplete ions Incomplete/ nance led	Unclear	Ovalized Over/Unde Part Incorre Part Lost/M Part Moveo Positioned Power Loss	ect lissing d Wrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
[	Ripples in Bend					Drill Holes		Offset					

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

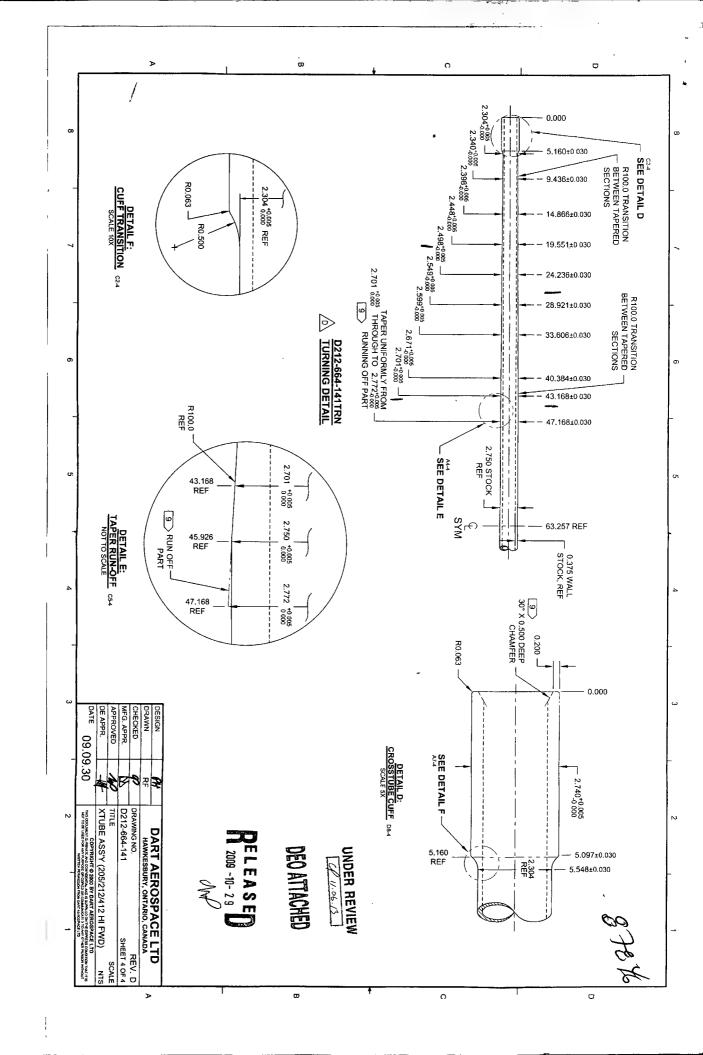
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

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											DQA:	Date	:
NCR:	Yes	/ No				WORK ORDER NON-O	100	NFORM	AANCE / UP	DATE			
											QA Closed:	Date	:
Work Ord	er.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part I	No.					Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube  Machining Small Fab  Thermoforming Finishing  Large Fab Composite			4	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial	Act	tion	Sign &		
Cause		Date	Step	Qty	(	or Non-conformance	Ch	nief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved													
	_					F	AUL	LT CATE	GORY				
Landi		Bending Centre Not Concentric to O/S Cracks Crushed/Crimped Cuffs Heat Treat				General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear Maintenance Mislabeled			Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned N	ct	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled
	$\vdash$	Inspection Strip in Tube				Cut Too Short	$\vdash$	Misread		<u> </u>	Power Loss/		Other
		Ripples in Bend				Drill Holes		Offset		<u></u>		_	

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

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DRAWING NO.	TITLE		REV. D	DART AEROSPACE LTI	D.E.O. NO.	SHEET NO.	SCALE
D212-664-141	XTUBE ASS	SY (205/212/412	HI FWD)	ENGINEERING ORDER	D212-664-141-D-1	SHEET 1 OF 2	· NTS
DRAWN	<u></u>	CHECKED	P	MFG. APPR. E	APPROVED NA,	DE APPR.	_
DATE 11.0	4.07	DATE	1), 6/1	DATE 11.04.(2	DATE 11/04/12	DATE 11.04.17	

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND

PAINT OUTSIDE PER DART QSI 005 4.2 REMOVE MASKING AND APPLY CLEAR COAT

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2

DELEASED 2011 -04- 180

UNDER REVIEW

3 11 07.28

											DQA:	Date	:
NCR:	Yes	/ No				WORK ORDER NON-O	O	<b>VFORM</b>	MANCE / UPD	ATE			
											QA Closed:	Date	:
. Work Ord	er.					DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part I	No.					Rework Scrap Use-as-is Work Order Update	Machining Small Fab Thermoforming Finishing			Small Fab Finishing	1	Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial Action			Sign &		
Cause		Date	Step	Qty	,	or Non-conformance	Ch	Chief Eng Description			Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator							1						
Material													
Setup													
Other													
Process		Ì											
Supplier													
Training													
Unapproved			<u> </u>										
-						F.	AUL	T CATE	GORY				
Landi	ng (	Gear			_	General		,		_	7	_	_
	_	Bending				Bend	L	Grain			Ovalized		Pressure/Forced
	_	Centre No	ot Concer	ntric to	o/s	BOM/Route	L_	Hardwa	re		Over/Under	tolerance	Temperature/Cure
	L	Cracks				Broken/Damaged		Inspecti	on Incomplete		Part Incorre	ct	Weld
	Crushed/Crimped.					Burrs		Instruct	ions Incomplete/U	nclear	Part Lost/M	issing	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Moved		
	Heat Treat					Countersink		Mislabe	led		Positioned \	<b>W</b> rong	
		Inspection Strip in Tube				Cut Too Short		Misread	1		Power Loss,	/Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

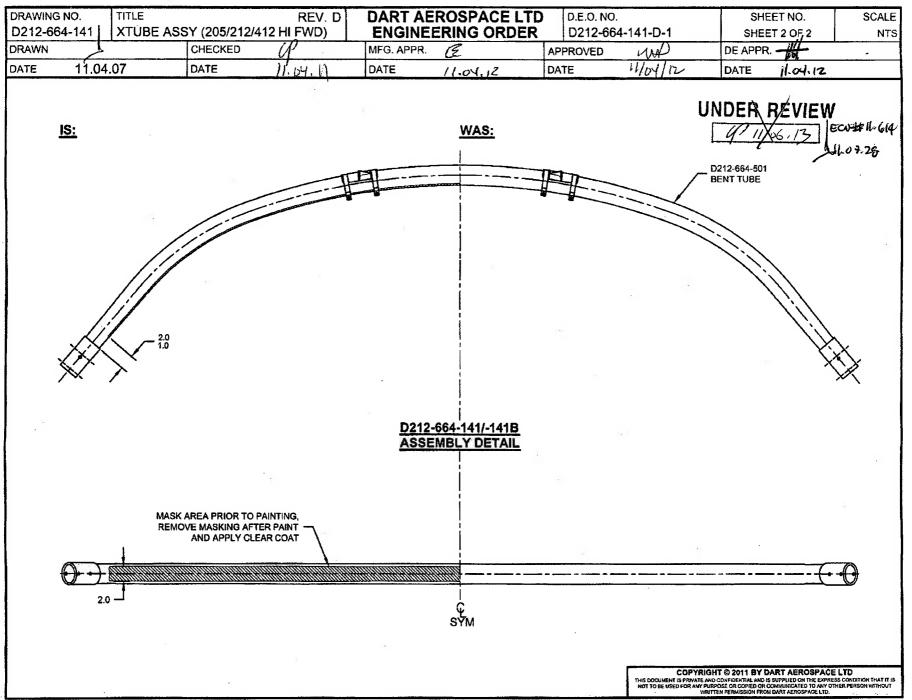
Drill Holes

Drawing

Finish

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			DQA:	_ Date:	
ICR:	Yes / No	WORK ORDER NON-CONFORMANCE / UPDATE			

									QA Closed:	Date:	
Work Order:					DISPOSITION		AGAINST DEPARTMENT/PROCESS				
Part No					Rework Scrap Use-as-is Work Order Update	Thern	Skid-tube  Machining  noforming  Large Fab	Crosstube Small Fab Finishing Composite		Water Jet d. Eng. Coor. e/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update	Initial	Acti	ion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief Eng	Descri	iption	Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling		ļ					- 1	!			
Operator											
Material											
Setup		1									
Other									:		
Process											
Supplier											
Training		1					_				
Unapproved											
					F.A	AULT CATE	GORY			· · · · · · · · · · · · · · · · · · ·	
Landii	ng Gear				General				,		,
	Bending				Bend	Grain			Ovalized		Pressure/Forced
	Centre Not Concentric to O/S				BOM/Route	Hardware			Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged	⊢ `	Inspection Incomplete		Part Incorred	—	Weld
	Crushed/	Crimped.			Burrs	Instruct	Instructions Incomplete/Unclear		Part Lost/Missing Wrong Stock Pul		Wrong Stock Pulled
	Cuffs				Contamination	Mainte	Maintenance		Part Moved		
	Heat Trea	at		_	Countersink	Mislabe	Mislabeled		Positioned Wrong		
	Inspection Strip in Tube				Cut Too Short	Misread	Misread		Power Loss/	Surge	Other
	Ripples in Bend				Drill Holes	Offset	Offset				
	Torque V			٦	Drawing	Out of 0	Calibration				
	Turning Sequence				Finish	Out of S	Sequence				
	Wave/Twist in Tube				Folio	Outside	Dimensions				

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DRAWING NO.	TITLE	REV. D	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D212-664-141	CROSSTUE	BE ASS'Y (205 HI FWD)	ENGINEERING ORDER	D212-664-141-D-2	SHEET 1 OF 1	NTS
DRAWN /	R	CHECKED A>>	MFG. APPR.	APPROVED MA	DE APPR.	
DATE 11.	7.15	DATE 11.07.20	DATE 11.07.21	DATE /1/07/2)	DATE 11.07.2	1

#### PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

#### **CHANGE:**

#### IS:

item	Qty -141	Qty -141B	Part Number	Description				
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2				

#### WAS:

			1	
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023
			1	ADHESIVE (TEXTRON/BELL SPEC. 299-947-100,
				TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

#### IS

- 12) TO INSTALL D2893-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

#### WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



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DQA: \_\_\_\_\_ Date: \_\_\_\_

NCR: Yes / No

# WORK ORDER NON-CONFORMANCE / UPDATE

							121	QA Closed:	Date	<u>:                                      </u>	
			·	DISPOSITION		AGAINST (			DEPARTMENT/PROCESS		
Work Order:  Part No.  NCR No.				Rework Scrap Use-as-is Work Order Update	Ther	Skid-tube Crosstube  Machining Small Fab  Thermoforming Finishing  Large Fab Composite		Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier		Engineering Quality Other	
	1723		Descri	otion of work order update	Initial	Act	tion	Sign &			
Date	Step	Qty	c	or Non-conformance	Chief Eng	Desc	ription	Date	Verification	QC Inspector	
			,				3			,	
	i	<u>ll</u>		> F.	AULT CATI	GORY		1			
g Gear										•	
Bending Centre Not Concentric to O/S Cracks Crushed/Crimped Cuffs Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion Turning Sequence				Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing Finish	Inspec Instruct Maint Mislab Misrea Offset Out of	tion Incomplete tions Incomplete/ enance eled d Calibration Sequence	Unclear	Part Incorred Part Lost/M Part Moved Positioned V	ct issing Vrong Surge	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other	
	Date  Date  Gear  Bending  Centre No  Cracks  Crushed/o  Cuffs  Heat Trea  Inspection  Ripples in  Torque W  Turning S	Date Step  Date Step  Gear  Bending Centre Not Conce Cracks Crushed/Crimped Cuffs Heat Treat Inspection Strip in Ripples in Bend Torque Waves in E	Date Step Qty  Date Step Qty  Gear  Bending Centre Not Concentric to O Cracks Crushed/Crimped. Cuffs Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion	Date Step Qty Company	Rework Scrap Use-as-is Work Order Update  Date Step Qty Or Non-conformance  F. General Bending Centre Not Concentric to O/S Cracks Crushed/Crimped Curthe Address Crushed/Crimped Curthe Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion Turning Sequence  Description of work order update or Non-conformance  F. General Bend Bend Bend Bend BoM/Route Broken/Damaged Contamination Countersink Cut Too Short Drill Holes Drawing Finish	Rework Scrap Use-as-is Work Order Update  Date Step Qty  Description of work order update or Non-conformance  FAULT CATE Gear General Bending Centre Not Concentric to O/S Cracks Cracks Cracks Broken/Damaged Crushed/Crimped Cutffs Contamination Heat Treat Inspection Strip in Tube Ripples in Bend Torque Waves in Extrusion Turning Sequence  Finish  There Scrap Use-as-is Vork Order update Initial Chief Eng  FAULT CATE Scrap Work Order update Initial Chief Eng In	Rework Scrap Use-as-is Work Order Update Thermoforming Large Fab   Date Step Qty Description of work order update Chief Eng Description of work order update or Non-conformance Chief Eng Description of work order update Chief Eng Description Operation Description of work order update Chief Eng Description Description Operation Description Operation Description Operation Op	Rework Scrap Wachining Small Fab Use-as-is Work Order Update Initial Large Fab Composite    Date   Step   Qty   Description of work order update or Non-conformance   Initial Chief Eng   Description	DISPOSITION  Rework   Scrap   Machining   Small Fab   Pro   Rec/Stor   Thermoforming   Finishing   Rec/Stor   Composite    Date   Step   Qty   Or Non-conformance   Chief Eng   Description   Date    Bending   Bend   Grain   Court/Liber   Cou	DISPOSITION   Rework   Skid-tube   Crosstube   Water Jet	